Application No. 10/678,523
Amendment Under 37 C.F.R. §1.116 dated May 7, 2009
Final Office Action mail date: January 7, 2009

Listing of Claims:

This listing of claims will replace all prior versions, and listings, of claims in the

application:

1.   (Cancelled)

2.   (Cancelled)

3.   (Cancelled)

4.   (Cancelled)

5.   (Cancelled)

6.   (Cancelled)

7.   (Cancelled)

8.   (Cancelled)

9.   (Cancelled)

10.   (Cancelled)

11.   (Cancelled)

12.   (Currently Amended) A method for finding a next free bit in a register having N

bits and a current pointer pointing to one of the bits, the method comprising:

breaking the N bits of a check vector in the register into M parts, wherein N and M are

integers and 1< M<N; and

selecting with a port selector an available part that has a free bit;

wherein the available part is a first part, having a free bit, to the left of the part pointed to

by the current pointer; and

wherein the step for selecting the available part comprises:

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breaking the current pointer into upper bits and lower bits, wherein the current pointer has X bits, the upper bits have Y bits and a value U, and the lower bits have X-Y bits and a value L, and wherein $0 \leq U \leq 2^Y-1$, and $0 \leq L \leq 2^{X-Y}-1$, where all of X, Y, U, and L are integers;

creating a check sector, wherein each bit of the check sector results from performing an AND operation to all bits of a corresponding part of the M parts;

obtaining an add vector by setting its bit number U;

adding the add vector to the check sector to obtain a sum; and

multiplying the sum with an inverse of the check sector.

13.   (Cancelled)

14.   (Currently Amended) A method for finding a next free bit in a register having N bits and a current pointer pointing to one of the bits, the method comprising:

breaking the N bits of a check vector in the register into M parts, wherein N and M are integers and 1< M<N; and

selecting with a port selector an available part that has a free bit;

wherein the available part is a first part, having a free bit, to the left of the part pointed to by the current pointer;

the method further comprising finding a free bit in the available part; and

wherein the step for finding a free bit comprises:

increasing the available part by 1; and

multiplying the increased available part with an inverse of the available part.

15.   (Cancelled)

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16.   (Cancelled)

17.   (Cancelled)

18.   (Cancelled)

19.   (Currently Amended) A method for finding a next free bit in a register having N bits and a current pointer pointing to one of the bits, the method comprising:

breaking the N bits of a check vector in the register into M parts, wherein N and M are integers and 1< M<N;

selecting with a port selector an available part that has a free bit;

creating a check sector, wherein each bit of the check sector results from performing an AND operation to all bits of a corresponding part of the M parts; and

deciding whether the register has a free bit by performing an AND operation to all bits of the check sector.

20.   (Cancelled)

21.   (Cancelled)

22.   (Cancelled)

23.   (Cancelled)

24.   (Cancelled)

25.   (Currently Amended) An apparatus for finding a next free bit in a register having N bits and a current pointer pointing to one of the bits, the apparatus comprising:

a first breaker for breaking the N bits of the check vector in the register into M parts, wherein N and M are integers and 1< M<N; and

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a <u>port</u> selector for selecting an available part that has a free bit, wherein the selector selects the available part on the left of the part pointed to by the current pointer;

a first breaker for breaking the N bits of the check vector in the register into M parts, wherein N and M are integers and $1< M<N$; and

a check sector generator for generating a check sector, wherein each bit of the check sector results from performing an AND operation to all bits of a corresponding part of the M parts; and

a second breaker for breaking the current pointer into upper bits and lower bits, wherein the current pointer has X bits, the upper bits have Y bits and a value U, and the lower bits have X-Y bits and a value L, and wherein $0\leq U\leq 2^Y-1$, and $0\leq L\leq 2^{X-Y}-1$, where all of X, Y, U, and L are integers;

wherein the selector comprises:

an add vector generator, setting bit number U of the add vector;

an adder for adding the add vector to the check sector to obtain a sum; and

a multiplier for multiplying the sum with an inverse of the check sector.

26.   (Cancelled)

27.   (Cancelled)

28.   (Cancelled)

29.   (Cancelled)

30.   (Cancelled)

31.   (Cancelled)

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32.   (Currently Amended) An apparatus for finding a next free bit in a register having N bits and a current pointer pointing to one of the bits, the apparatus comprising:

a first breaker for breaking the N bits of the check vector in the register into M parts, wherein N and M are integers and 1< M<N;

a port selector for selecting an available part that has a free bit;

a second breaker for breaking the current pointer into upper bits and lower bits, wherein the current pointer has X bits, the upper bits have Y bits and a value U, and the lower bits have X-Y bits and a value L, and wherein $0\leq U\leq 2^Y-1$, and $0\leq L\leq 2^{X-Y}-1$, where all of X, Y, U, and L are integers; and

a free bit finder, wherein the free bit finder finds a free bit on the left of the bit pointed to by the current pointer;

wherein the free bit finder comprises:

an add vector generator, setting bit number L of the add vector;

an adder for adding the add vector to the available part to obtain a sum; and

a multiplier for multiplying the sum with an inverse of the available part.

33.   (Cancelled).

34.   (Currently Amended) An apparatus for finding a next free bit in a register having N bits and a current pointer pointing to one of the bits, the apparatus comprising:

a first breaker for breaking the N bits of the check vector in the register into M parts, wherein N and M are integers and 1< M<N;

a port selector for selecting an available part that has a free bit; and

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a free bit finder, wherein the free bit finder finds a free bit from the beginning of the available part;

wherein the free bit finder comprises:

an adder for increasing the available part by 1; and

a multiplier for multiplying the increased available part with an inverse of the available part.

35.   (Currently Amended) An apparatus for finding a next free bit in a register having N bits and a current pointer pointing to one of the bits, the apparatus comprising:

a first breaker for breaking the N bits of the check vector in the register into M parts, wherein N and M are integers and $1 < M < N$;

a ~~port~~ selector for selecting an available part that has a free bit;

a check sector generator for generating a check sector, wherein each bit of the check sector results from performing an AND operation to all bits of a corresponding part of the M parts; and

a register status unit for performing an AND operation to all bits of the check sector.

36.   (Previously Presented) The apparatus according to claim 35, further comprising:

a next vector generator for generating the next vector with the found free bit masked.

37.   (Cancelled)

38.   (Cancelled)

39.   (Previously Presented) The apparatus according to claim 49, wherein the selecting means selects the available part on the left of the part pointed to by the current pointer.

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40.   (Previously Presented) The apparatus according to claim 51, further comprising:

means for generating a check sector, wherein each bit of the check sector results from

performing an AND operation to all bits of a corresponding part of the M parts.

41.   (Cancelled)

42.   (Cancelled)

43.   (Cancelled)

44.   (Cancelled)

45.   (Cancelled)

46.   (Cancelled)

47.   (Cancelled)

48.   (Cancelled)

49.   (Previously Presented) An apparatus for finding a next free bit in a register

having N bits and a current pointer pointing to one of the bits, the apparatus comprising:

means for breaking the N bits of the check vector in the register into M parts, wherein N

and M are integers and $1 < M \le N$; and

means for selecting an available part that has a free bit;

a second means for breaking the current pointer into upper bits and lower bits, wherein

the current pointer has X bits, the upper bits have Y bits and a value U, and the lower bits have

X-Y bits and a value L, and wherein $0 \le U \le 2^{Y}-1$, and $0 \le L \le 2^{X-Y}-1$, where all of X, Y, U, and

L are integers; and

means for finding the free bit, wherein the free bit finding means finds the free bit on the

left of the bit pointed to by the current pointer;

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wherein the free bit finding means comprises:

means for generating an add vector, setting bit number L of the add vector;

means for adding the add vector to the available part to obtain a sum; and

means for multiplying the sum with an inverse of the available part.

50.   (Cancelled)

51.   (Previously Presented) An apparatus for finding a next free bit in a register having N bits and a current pointer pointing to one of the bits, the apparatus comprising:

means for breaking the N bits of the check vector in the register into M parts, wherein N and M are integers and $1 < M < N$; and

means for selecting an available part that has a free bit; and

means for finding the free bit, wherein the free bit finding means finds the free bit from the beginning of the available part;

wherein the free bit finding means comprises:

means for increasing the available part by 1; and

means for multiplying the increased available part with an inverse of the available part.

52.   (Previously Presented) An apparatus for finding a next free bit in a register having N bits and a current pointer pointing to one of the bits, the apparatus comprising:

means for breaking the N bits of the check vector in the register into M parts, wherein N and M are integers and $1 < M < N$;

means for selecting an available part that has a free bit;

means for generating a check sector, wherein each bit of the check sector results from

performing an AND operation to all bits of a corresponding part of the M parts; and

means for performing an AND operation to all bits of the check sector.

53. (Previously Presented) The apparatus according to claim 52, further comprising:

means for generating the next vector with the found free bit masked.

54. (Cancelled)

55. (Cancelled)

56. (Cancelled)

57. (Cancelled)

58. (Cancelled)

59. (Cancelled)

60. (Cancelled)

61. (Cancelled)

62. (Cancelled)

63. (Cancelled)

64. (Cancelled)

65. (Cancelled)

66. (Cancelled)

67. (Cancelled)

68. (Cancelled)

69. (Cancelled)

70. (Cancelled)

71. (Cancelled)

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72.   (Cancelled)

73.   (Cancelled)

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81.   (Cancelled)

82.   (Cancelled)

83.   (Cancelled)

84.   (Cancelled)

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86.   (Cancelled)

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88.   (Cancelled)

89.   (Cancelled)

90.   (Cancelled)

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92.   (Cancelled)

93.   (Cancelled)

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94.   (Cancelled)

95.   (Cancelled)

96.   (Cancelled)